

Application No. 10/084,962

Response to Office Action

Dated July 14, 2005

January 13, 2006

REMARKS/ARGUMENTS

Claims 17-34 are presently pending in this application. None of the claims have been amended in this paper. The last clause in claim 17, however, was inadvertently omitted in the response to the previous Office Action dated September 23, 2004, and has been correctly included in the current listing of claims in this paper.

In the outstanding Office Action dated July 14, 2005, the Examiner withdrew the rejection of the pending claims over Landau U.S. Patent No. 6,261,433. The pending claims, however, were rejected on two new grounds as follows:

- (a) Claims 17 and 21-23 stand rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,670,034 issued to Lowery ("Lowery"); and
- (b) Claims 17-34 stand rejected under 35 U.S.C. § 103(e) over U.S. Patent No. 6,391,166 B1 issued to Wang ("Wang").

The Examiner is respectfully requested to reconsider both new grounds of rejection for the following reasons.

A. Response to Section 102 Rejection – Lowery

Claims 17 and 21-23 were rejected under Section 102 over Lowery on the grounds that this reference discloses "an electroplating apparatus comprising an electrolytic tank (Fig. 1 numeral 12), semiconductor wafer (Fig. 5 numeral 116),

Application No. 10/084,962

Response to Office Action

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January 13, 2006

wafer contact pins (Fig. 5 numeral 136, col. 7 lines 22-27), and two anodes (Fig. 3 numeral 72A and 72B, col. 5 lines 22-23)." (Office Action, page 2, paragraph 4.) Additionally, with respect to the secondary anode of claim 17, the Examiner further contends that the feature "for providing a variable current to said semiconductor wafer" is not entitled to any patentable weight on the grounds it merely states the intended use for the secondary anode. For the reason explained below, claim 17 is patentable over Lowery because claim 17 includes additional features not noted by the Examiner. And, because all of the claimed features are entitled to patentable weight.

Claim 17 is directed toward a system for electroplating a layer of material on a semiconductor wafer. An embodiment of the system includes an electrochemical cell having a primary anode, a cathode contact, and a chamber in which the primary anode and the cathode contact are disposed. The system further includes at least one secondary anode for providing a variable current to the semiconductor wafer, and a power source coupled to the primary anode and the secondary anode. The power source is capable of producing a variable current by providing varying levels of voltage to the primary anode and the secondary anode. Because the power source is configured to provide different voltage levels to the primary and secondary anodes, the secondary anode has a structure that provides "a variable current to the semiconductor wafer" separately from the primary anode.

Lowery discloses an electrolytic plating apparatus with commonly connected anodes. Referring to Figure 2 of Lowery, this reference discloses a tank

Application No. 10/084,962

Response to Office Action

Dated July 14, 2005

January 13, 2006

12 and an anode assembly 18 having a support rod 50 that extends into the tank 12. Referring to Figure 3 of Lowery, the support rod 50 is covered with a non-conductive, corrosion resistant polymer jacket 68, and an electrically conductive bar 74 is attached to the support rod 50. (Column 5, lines 21-29.) The left and right anodes 72a shown in Figure 3 are connected to opposite ends of the bar 74 such that the voltage at the left anode is inherently the same as that at the right anode. (Column 5, lines 29-34.) As a result, the left and right anodes in Lowery appear to be merely two interconnected contacts of the same anode.

Claim 17 is not anticipated by Lowery because this reference fails to disclose or suggest several features called for by that claim. For example, Lowery fails to disclose or suggest a primary anode and a secondary anode for providing a variable current to the semiconductor wafer. The feature of the secondary anode defined by the phrase "for providing a variable current to said semiconductor wafer" limits the structure of the secondary anode to be electrically independent of the primary anode so that the power source can provide a varying "levels of voltage" to the primary and secondary anodes. Lowery accordingly fails to disclose or suggest a primary anode and a separate secondary anode that provides a variable current to the wafer. Lowery also fails to disclose or suggest a power source coupled to the primary anode and the secondary anode such that the power source produces the variable current by providing varying levels of voltage to the primary and secondary anodes. Lowery accordingly fails to disclose or suggest all of the features of claim 17.

Application No. 10/084,962

Response to Office Action

Dated July 14, 2005

January 13, 2006

Claim 17 distinguishes over Lowery considered under Section 103.

There is no motivation to modify Lowery to come up with the claimed combination of features set forth in claim 17. Lowery merely discloses two separate contacts that are commonly connected to a power source such that they provide the same current to the wafer. Lowery is completely silent with respect to providing different voltages to the anodes to provide varying currents to the wafer. Lowery is also completely silent regarding any advantage to be obtained by providing varying currents to the workpiece. Therefore, there is no motivation to modify Lowery to provide varying currents to the semiconductor wafer as set forth in claim 17. Claim 17 is accordingly patentable over Lowery under Section 103.

Claims 21-23 are patentable over Lowery for at least the reasons explained above with respect to claim 17. Claims 21-23 are further patentable over Lowery for the additional features set forth in these claims. Therefore, the rejection of claims 17 and 21-23 over Lowery should be withdrawn.

B. Response to Section 102(e) Rejection – Wang

Claims 17-34 were rejected under 35 U.S.C. § 102(e) over Wang. To expedite prosecution of the present application, the enclosed Declaration of Daniel J. Woodruff and Kyle M. Hanson under 37 C.F.R. § 1.131 establishes that the invention set forth in the present application was conceived and reduced to practice before the filing date of the earliest provisional application to which Wang claims priority. Therefore, without commenting on or conceding to the merits of Wang as a basis for rejecting any of the pending claims, the rejection of claims 17-34 over

Application No. 10/084,962

Response to Office Action

Dated July 14, 2005

January 13, 2006

Wang under 35 U.S.C. § 102(e) should be withdrawn because Wang does not qualify as prior art under 35 U.S.C. § 102(e).

C. Response To Double Patenting Rejection

The Examiner has also interposed a rejection of claims 17-34 on the grounds of double patenting, arguing that the claims are patentably indistinct from the claims of applicants' parent application, namely U.S. Patent No. 6,497,801. The Examiner is respectfully requested to reconsider that rejection.

As the Examiner is aware, the present claims are copied substantially from Applied Materials' U.S. Patent No. 6,193,860. As such, the format of the claims must, as the PTO rules require, be patterned after the claims of the Applied Materials patent. For that reason, a double patenting rejection is, applicants submit, not applicable and should not be made at least until the PTO determines whether applicants or Applied Materials is entitled to priority with respect to those claims. It would be entirely inappropriate to either amend the claims at this stage -- a procedure that could result in applicants' loss of right to context priority. Alternatively, it would likely be inappropriate to submit a terminal disclaimer. Once again, those considerations can only be determined once priority of invention is determined.

Under these circumstances, the Examiner is respectfully requested to reconsider the rejection based on double patenting.

Application No. 10/084,962

Response to Office Action

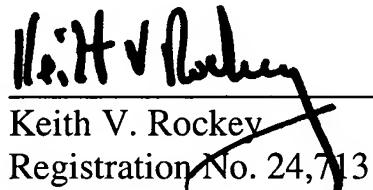
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January 13, 2006

D. Conclusion

In light of the foregoing, the pending claims comply with 35 U.S.C. § 112 and are patentable over the applied references. The applicants respectfully request reconsideration of the application and a declaration of interference between the present application and the Applied Materials '860 patent. If the Examiner has any questions or believes a teleconference would expedite prosecution of this application, she is encouraged to contact the undersigned representative at (312) 554-3310.

Respectfully submitted,


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CERTIFICATE OF MAILING (37 C.F.R. § 1.10)

I hereby certify that this correspondence and/or fee is, on the date shown below, being deposited with the United States Postal Service as Express Mail Post Office to Addressee, No. EV 622879401 US, with sufficient postage, under 37 C.F.R. § 1.10 and addressed to: Mail Stop Amendment, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 13, 2006.


Linda K. Johnson